

Upgrades to the ISS Water Recovery System

Matthew Kayatin, Kevin Takada, Layne Carter

The ISS Water Recovery System (WRS) includes the Water Processor Assembly (WPA) and the Urine Processor Assembly (UPA). The WRS produces potable water from a combination of crew urine (first processed through the UPA), crew latent, and Sabatier product water. Though the WRS has performed well since operations began in November 2008, several modifications have been identified to improve the overall system performance. These modifications can reduce resupply and improve overall system reliability, which is beneficial for the ongoing ISS mission as well as for future NASA manned missions. The following paper details efforts to improve the WPA through the use of Reverse Osmosis technology to reduce the resupply mass of the WPA Multifiltration Bed and improved catalyst for the WPA Catalytic Reactor to reduce the operational temperature and pressure. For the UPA, this paper discusses progress on various concepts for improving the reliability of the UPA, including the implementation of a more reliable drive belt, improved methods for managing condensate in the stationary bowl of the Distillation Assembly, deleting the Separator Plumbing Assembly, and evaluating upgrades to the UPA vacuum pump.